

IN THE CLAIMS

Please amend the claims as follows:

Claims 1-15 (Canceled).

Claim 16 (New): A cooling or heating device in an absorption heat pump of GAX type, comprising:

a generator;

a heat exchanger of GAX type;

an absorber;

a condenser;

an evaporator;

a pump connected to said absorber and generator;

a first circuit for refrigerant solution circulating through the device and connecting together at least said generator, GAX heat exchanger, absorber, condenser, evaporator, and pump; and

a valve device configured to modify said first circuit to vary a manner in which the absorber, condenser, and evaporator are connected together;

at least a first and a second heat exchange means for enabling at least one phase of the refrigerant solution circulating through said first circuit to be changed and to enable thermal energy to be exchanged against an external fluid, said first and second heat exchange means each comprising at least first and second mutually separate sub-heat exchangers arranged to function either as an evaporator or as an absorber and condenser, depending on an operating mode of the device.

Claim 17 (New): A device as claimed in claim 16, wherein when the device operates in a cooling mode, the valve device is configured to modify the first circuit such that the first heat exchange means operates as an evaporator, said first sub-heat exchanger of the second heat exchange means operates as a condenser and said second sub-heat exchanger of the second heat exchange means operates as an absorber, whereas when the device operates in a heating mode said valve device is configured to modify said first circuit such that said first sub-heat exchanger of the first heat exchange means operates as a condenser and said second sub-heat exchanger of the first heat exchange means operates as an absorber, and the second heat exchange means operates as an evaporator.

Claim 18 (New): A device as claimed in claim 16, wherein the first and second heat exchange means comprise at least the first and second separate sub-heat exchangers that are only two in number.

Claim 19 (New): A device as claimed in claim 16, further comprising a single hydraulic circuit for circulation of a liquid and configured to withdraw or receive thermal energy generated by the evaporator or by the condenser or by the absorber.

Claim 20 (New): A device as claimed 16, wherein the first circuit through which the refrigerant solution circulates and the valve device are formed to avoid dead branches not reached by said refrigerant solution, in two operating modes of the device.

Claim 21 (New): A device as claimed in claim 16, wherein in the second heat exchange means heat exchange takes place between the refrigerant solution and air circulating on an outside of said heat exchanger.

Claim 22 (New): A device as claimed in claim 16, wherein in the second heat exchange means heat exchange takes place between the refrigerant solution and a circulating liquid both of which lie within said second heat exchange means.

Claim 23 (New): A device as claimed in claim 22, wherein the second heat exchange means comprises a substantially tube-shaped casing having an inlet and an outlet for a first fluid, and a plurality of tubes disposed longitudinally in an interior of said casing; each tube being connected to an entry element and an exit element for a second fluid, the first fluid circulating within an interior of the casing in contact with outer solutions of said tubes; the tubes inside the casing being substantially directly in contact with each other and with the inner walls of said casing and having a cross-section to form within the casing a plurality of micro-channels parallel to the tubes for circulation of the first fluid.

Claim 24 (New): A device as claimed in claim 23, wherein between entry and exit portions the tubes present at least one portion having a cross-section of shape different from that of adjacent tube portions, the shape being such as to at least partly break and remix the flow of fluid circulating through the tube, and portions of the tube having a cross-section of different shape being formed of telescope shape and/or being in contact with each other, to maintain the tubes spaced apart.

Claim 25 (New): A device as claimed in claim 23, wherein the heat exchanger is of S shape, the casing housing the tubes comprising two semi-circular shells in correspondence with a curved portion.

Claim 26 (New): A device as claimed in claim 22, wherein the second heat exchange means comprises three separate side-by-side sub-heat exchangers.

Claim 27 (New): A device as claimed in claim 16, wherein the valve device includes a single valve comprising a plurality of valve members.

Claim 28 (New): A device as claimed in claim 27, wherein the single valve is a sixteen/fourteen-way valve.

Claim 29 (New): A method for controlling solution and/or refrigerant in a device claimed claim 16, using the at least first and second separate sub-heat exchangers of the at least first and second heat exchange means either as an evaporator or as an absorber and condenser, according to the operating mode of the device.

Claim 30 (New): A method for controlling solution and/or refrigerant in a device claimed in claim 16, avoiding dead branches not reached by said solution and/or refrigerant, in two modes of operation of the device.